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ABSTRACT

A total of 100 third and ninth grade students participated in a study to determine how children of different ages perceptually segment a continuing behavior sequence presented on a television program. The children were shown a short segment from a motion picture on a videotape viewer. Following the viewing, the children completed unitizing activities that involved sorting a series of cards into "units of perception." The cards contained "phase units" that described both the visual and auditory content present in the behavior sequence shown in the film. "Units of perception" were defined as the number of phase units the child perceived as belonging to one happening in the filmed sequence. The results revealed that the third grade children used smaller units to segment a televised behavior sequence than did ninth grade children. Supplementary analyses of the patterning of units of perception suggested that such segmentation of the behavior sequence occurred in a nonchance manner for both age groups. (FL)

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Theory and Methodology Division

CHILDREN'S PERCEPTUAL UNITIZING OF A TELEVISED BEHAVIOR SEQUENCE

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CHILDREN'S PERCEPTUAL UNITIZING OF A TELEVISED BEHAVIOR SEQUENCE

The major thrust of recent research on children's information processing of television has centered on children's recall and comprehension of television stimuli (Hagen, 1967; Collins, 1970, 1973, 1974, 1975; Leifer and Roberts, 1972; Calder, Robertson, and Rossiter, 1975; Ward, Wackman and Wartella, 1977). Few studies have examined activities earlier in processing, such as attentional and perceptual activities; exceptions are attention studies such as Anderson and Levin, 1976; Levin and Anderson, 1976; Ward and Wackman, 1973; and Wartella and Ettema, 1974.

The study presented here introduces research on a relatively neglected aspect of children's perceptual processing of televised stimuli: how children of different ages perceptually segment or chunk an ongoing behavior stream presented on a televised program. The concept of a "stream of behavior" refers to the progression of events of an ongoing behavior sequence. It is an observer concept. As observers of other people's behavior we arrange that behavior in some sequential manner. Similarly, as we watch behavior occurring during the course of a television program, the behavior comes across the screen in an ongoing sequential manner. The issue addressed here is how child observers break up the behavior stream. An example may help to identify the notion of segmenting a behavior stream.

Suppose on my way to work I stop in a drugstore. While waiting to be served, I watch a young girl come in, peruse the candy counter, make a selection and pay for the candy. The young girl then walks out of the store. If someone should ask what I had just seen, I might say that I saw a young girl buy some candy.

If the questioner pursued this example and asked, "But what specifically did you see?", I might respond that I watched the girl walk to the candy counter and then pick up and examine two candy bars. She then selected one candy bar. She walked to the counter. The clerk asked for and received fifteen cents from the girl. The girl then walked to the door and went out of the drugstore.

This example indicates how the behavior stream of a girl buying candy can be described in several ways. One can summarize a meaningful description of "a girl buying candy," or one can discuss with greater specificity the exact movements of the girl observed. How an observer chooses to describe the girl's behavior is an indication of the amount of behavior he or she sees as comprising a unit of the behavior stream. Further, the size of these units can vary from a large, all-encompassing unit (e.g., "The girl buys some candy") to smaller units with greater specificity (e.g., "The girl opened the door to the drugstore.").

In the example, the descriptions of the girl's activities provide indications of how the observer segmented the behavior sequence observed. This process of breaking up an ongoing stream of behavior into different parts or units is referred to here as <u>perceptual unitizing activities</u> in information processing. How observers segment ongoing behavior sequences provide indications of how the information is perceptually encoded for further processing.

The term unit of perception refers to the amount of behavior an observer discriminates as belonging together as one part of the behavior sequence. In the example provided above, the sentence "the girl selects a candy bar," encompasses a unit of perception from the overall behavior sequence. This behavior was separated from other behaviors in the behavior stream.

Now that definitions of unitizing activities and units of perception are provided, the next question is: how do unitizing activities fit into a model of information processing? Unitizing activities are part of perception processes involved in processing information. As Bruner (1975) notes, perception "involves an act of categorization"; it is an inferential process in which the perceiver is continually involved in categorizing and transforming the stimulus to which he is attending (Bruner, 1975; p. 123).

Unitizing a behavior stream is an act of categorization, whereby the observer constructs a perceptual code of the ongoing behavior, the units of perception used to divide the behavior stream are the elements of the perceptual code. Thus, examining unitizing activities focuses concern primarily on how behavior is perceived and not what information is perceived from an audio-visual behavior sequence.

This distinction between <u>how</u> information is processed and <u>what</u> information is processed is a useful one. It suggests that one can examine the relationship between how behavior is segmented and what information observers acquire through watching a behavior sequence. Most previous research has focused on "what" information children recall and comprehend from televised programming.

<u>Research on Perceptual Unitizing</u> The behavior stream concept and notions of perceptual unitizing are founded in the theoretical orientation of Barker and Wright (1955). During the 1950's Wright and Barker conducted several observational studies of children's behavior in naturalistic settings (Wright and Barker, 1951; Barker and Wright, 1955). During the course of examining their observational reports, they developed an analytic scheme for coding observers' perceptions of the

children's behavior. This process resulted in a theory of behavior unit formation involving conceptual distinctions among different units of behavior events. The basic assumption of this theory is that a stream of behavior is composed of a hierarchical structure of units of behavior. Two units which have received subsequent research attention are phase units (the smallest unit of an action hierarchy which cannot be further broken down into meaningful units of behavior and are constituted of muscle movement) and episodes (or a commonly recognizable unit of action within its context).

Barker and Wright (1955) found high consistency among trained observers' segmentation of a behavior stream (reliability estimates ranged between 72 and 92 percent accuracy). Two of their students (Lyons, 1956; and Dickman, 1963) extended their notions of unitizing activities to examine how consistent naive adult subjects are in segmenting a stream of behavior.

In an early study of adults' perception of meaningful units in a behavior stream, Dickman (1963) found that adult subjects can perceive meaningful units within the action of a filmed behavior sequence. Further, he found that the patterning of units was in a non-chance manner, although there was little segmentation of identical units among the 38 college students in his study.

Two factors have been found to influence the size of units adults use to segment filmed behavior sequences: (1) general cognitive skills subjects bring to the viewing situation and (2) situational constraints, such as the audience's perception of uncertainty about the actors' future movements. Lyons (1956), for instance, in a comparative study of normal and schizophrenic adult's perceptual unitizing of a behavioral

sequence, found that adult schizophrenics, who have greater difficulty allocating their attention to relevant information and organizing their perceptual field, tend to use smaller units to segment a behavior sequence than do normal adults. Further, Newston (1973) in a more recent study of college students' perceptual unitizing of a videotaped behavior sequence found some evidence that subjects use smaller units to segment behavior when they are uncertain about the future direction of the ensuing behavior.

These studies suggested that unitizing behavior is one indicator of observers' encoding of filmed behavior sequences and as such should be influenced by the observers' more general abilities to process information. Further, perceptual unitizing studies, coupled with research on children's information processing of televised stimuli, provide a rationale for suggesting developmental changes in children's perceptual unitizing of behavior sequences.

In several areas of information processing, there is evidence that as children grow older they become better able to organize their perceptual field and select relevant information from this field (Pick, et al, 1975; Maccoby and Hagen, 1965; Hagen, 1972; and Hagen and Hale, 1973). There are similar findings from research on children's recall of central and peripheral information from television programs which indicate that beyond middle childhood children are better able to recall information adults consider central to recalling the plot outlines (Leifer, et al, 1971; Hale, Miller and Stevenson, 1968; Collins, 1970; and Katzman, 1972). These studies also report a corresponding decrease in recall of nonessential or secondary information as children grow older. Only Hawkins (1973) does not report such developmental differences.

Hagen (1972) advances the explanation that such findings in differences in attention to central vs. peripheral information in task situations can be explained by children's acquisition of greater ability to allocate their attention to relevant information in recall tasks as they grow older. Even Hawkins' (1973) research is consistent with this argument since older children are able to attend to and increase their recall of peripheral information when the film held their interest, perhaps sharpening their attention.

Furthermore, research on developmental changes of children's apprehension span for processing information (or children's limits for processing information) have shown an age-related increase in children's capacity for storing and processing information occurring during middle childhood (Randhawa, 1971; Friedrich, 1974; and Farnham-Diggory, 1972). Collins (1975) similarly found that processing space limitations may be one factor affecting young children's comprehension of television programs. He exposed second and eighth grade children to four versions of an aggressive television program and measured both recall and inference-making about the discreet scenes of the plot. He found that younger children not only recall less information from television shows but also did not appear to be organizing the information in any meaningful fashion as they watched the program.

Similarly, research by Tada (1969) on children's comprehension of film images and various kinds of production techniques has shown age-related differences in children's ability to understand and predict the direction of theme development. He found that elementary school children had difficulty understanding the symbolic meanings of different film techniques such as scenic shifts, rhythm montage and image symbolism.

Collins' and Tada's research suggest that elementary school children should be more uncertain about the future direction of a televised behavior sequence. Whether this occurs because young children do not try to organize the information about the program and draw inferences about the events occurring, because they have difficulty reading film images and techniques used to convey audio-visual themes, or because they have less experience with the phenomena being depicted, is not clear. Perhaps all three factors are present.

The argument can be advanced, then, that children in middle childhood (1) have a lessened ability to allocate attention to central details of a televised behavior sequence. Such difficulty in allocating attention has been found to reduce the size of units adults use to segment an ongoing behavior sequence (Lyons, 1956). (2) They show evidence of shorter processing space; and (3) they show general confusion in organizing audio-visual information, suggesting that they have greater uncertainty in predicting the future direction of the behavior portrayed on a televised program. This should pose a constraint on unitizing activities by reducing the size of units of perception that young children employ as Newtson (1972) found in research with adults.

Thus, the hypothesis to be tested in this study is that when children in middle childhood and children older than middle childhood are presented with a televised presentation of an ongoing stream of behavior, the younger children will use relatively smaller units of perception to segment the behavior stream than will the older children.

METHODS

To test the hypothesis, a study was designed as a partial replication of Dickman's 1963 research: the same film sequence was utilized as the stimulus and similar procedures were used to measure the audience's unitizing behavior. Thus, the study affords direct comparison of children's unitizing behavior with an adult sample.

Fifty children at each of two grade levels, third and ninth grade, participated in the study. There were equal numbers of boys and girls at each grade level. These children were randomly selected from class lists of students in a middle class suburban school district in St. Paul, Minnesota.

Children were brought in pairs to a small viewing room in their school and asked to watch a short six-minute segment from the film "Our Vines Have Tender Grapes," a 1930 MGM film in black and white on a 12-inch videotape recorder. This was a shorter version of the 8-minute sequence used by Dickman.

The plot focuses on a young girl, Selma, and her cousin Arnold. Upon coming home from school to Selma's parent's farm, Selma and Arnold are surprised when her father gives her a gift of a baby calf. The setting is a midwest farm during the 1930's. This film sequence comprises approximately five scenes or content action sequences. While they can be distinguished in terms of new actors and content presented in the film, only the transition to the last scene presents a noticeable visual break or camera cut. All other transitions are made with continuous shots of the characters changing location in the farmyard.

After reviewing the videotape presentation, measures of children's unitizing activities were taken. The measure used was a replication of Dickman's procedure. The procedure consists of sorting a series of three by five cards into "units of perception," operationally defined as "happenings" in the program. Each card contains a "phase unit" or minimal molar unit of behavior as defined by Barker and Wright (1955). These phase units describe both the visual and auditory content present in the behavior sequence. See Wartella (1976) for the 123 phase units used in the card sort.

The exact phase unit distinctions made by Dickman were employed in this research. The only deviation was that in several cases the phase unit descriptions were simplified with shorter and simpler words to aid the young children's comprehension. According to Dickman, the initial coding of this behavior sequence was performed by him and several coders involved in Barker and Wright's research project on Midwest and its Children.[1] Several comments are in order about this measurement procedure.

The operational definition of "units of perception" in the number of phase units the child perceives as belonging to one "happening" in the filmed sequence. According to Newtson (1973) this measure reduces the researcher's ability to discriminate the finer distinction subjects may make in unitizing behavior, i.e., perhaps the "phase units" are not perceived by the subjects as the "smallest molar unit of behavior." Furthermore, Newtson criticizes this procedure because it is made after

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[1]This information was obtained through personal correspondence with Mr. Dickman in March, 1975.

the audience views the program and not during the actual viewing situation. Alternatively, Newtson suggests using a measurement technique whereby the subjects, through the use of a mechanical button-pushing device, can simultaneously segment the behavior stream as they view the stimulus film.

Newtson's measurement procedure worked well with his adult subjects, however, such a device was rejected for the present study because it was thought to be too distracting and difficult for the younger children in the sample. The present concern was to maximize the children's attention to the audio-visual stimulus with the least disruption. Therefore, the Dickman measurement procedure was considered less distracting. Although this procedure may not discriminate units smaller than phase units for some subjects, it would at worst provide a conservative measure of the fineness of perceived units for the younger subjects.

A second criticism is that the measure comes after the actual viewing of the film. It is argued that perception processes should be measured during actual viewing and before subsequent processing activities can take place. Measurement of unitizing activity after viewing the film is likely to have followed the child's further processing of the stimulus. However, similar to recall measures which are used to index children's attention to a stimulus (see Pick, et al, 1975), the actual procedure of sorting through cards which retell the narrative and action components of the stimulus is assumed to aid the child in reconstructing their perceptual processing of the videotape. That is, the actual card sort is assumed to call forth those processing activities the child experienced while viewing the film and reconstruct

their unitizing activity. As such, the card sorting procedure is an approximation to the actual perceptual activities the child engaged in while viewing the stimulus.

For the present study, the advantages of the Dickman procedure were considered to outweigh the disadvantages in that this has several strengths: (1) it offers minimal disruption to the viewing situation; (2) it presents a conservative measure of the fineness of the units of perception the subjects might use; (3) it produces data which can be directly compared to data obtained on adult subjects viewing the same stimulus film; and (4) it is more easily administered to child subjects.

The children were introduced to the perceptual unitizing measure as follows:

"You know when you watch television lots of things happen in the program. The different things that you see on the program can be called 'happenings.' Now, I want to know what 'happenings' you saw in the program you just watched. The way I want you to tell me what the happenings are in the program you saw is by sorting some cards for me into happenings on the program.

Here on the table I have some cards which tell the story that you just saw on television. The cards are numbered in the same order as the events happen in the program. But each card has only a small part of the show described on it. If you go through all the cards in order you get the whole story.

What I want you to do is to divide these cards into groups so that each group represents a happening in the show. There is no right answer, you can have as many groups or piles of cards as you want just so long as each group represents a happening in the show. And you can go back any time you want and change your mind about how many cards make up a happening.

There is no time limit on how long to take, just go at your own pace. Please use all the cards."

The child's attention was then led to a table with 123 three by five cards to sort into units of perception. This sorting procedure took between ten and 20 minutes for each child; younger children tended

to take a bit longer. For about half of the third-grade children, the experimenter read each card to the child to assist in their sorting of the cards. The remainder of the third-grade subjects formed the card sort without assistance.

RESULTS

The measure of children's units of perception used to test the hypothesis is the mean number of units used to segment the six-minute filmed behavior sequence. Since the children were asked to sort 123 phase unit cards, the sorting could produce from one to 123 perception units, although the actual range was much smaller, from 2 to 50 units.

To test the hypothesis that the third grade children would use smaller units of perception than ninth grade children, a t-test on the difference between the mean number of units of perception used by each age group was computed. Table 1 presents these data and indicates that, as predicted, the younger children use more units to segment the film than do the older children (one-tailed $t = 1.96$, $p<.026$).

[Insert Table 1 here]

While the standard deviation is slightly larger for the younger age group a test of homogeneity of variances[2] indicates that the variances of the two groups are not significantly different ($F = 1.22$, $(df = 49, 49)$, $p>.10$).

Subsequent analyses indicate that there are no significant differences in mean units of perception by sex of child ($p>.10$).

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[2] The test for equal variances used was $F = \frac{(s.d._1)^2}{(s.d._2)^2}$ $(n_1 - 1, n_2 - 1)$ from Winer (1965).

The mean number of units for boys is 14.34 and for girls is 15.46. Since no sex differences in segmenting behavior were predicted, a posteriori tests were conducted of group means for third and ninth grade boys and girls. Table 2 presents these group means. Use of the Scheffe procedure ($\alpha = .10$) indicates no significant differences among the groups.

[Insert Table 2 here]

Thus, the main effect on the size of the units of perception children use to segment ongoing behavior sequences is age of the child, as predicted. Younger children tend to use smaller units of perception (and thus have a larger group mean number of units of perception) than do the older children. Also, there are no significant differences in the mean number of units of perception by sex of the child.

Patterning of Perception Units Figures one and two present the location of perception units for each third and ninth grade subject.

[Insert Figures 1 and 2 about here]

Although no hypotheses were offered regarding the similarity or dissimilarity in the patterning of perception units, several subsequent analyses of these data were conducted to examine this question. These analyses are comparable to ones conducted on adult data by Dickman (1963). One goal of these analyses was to compare the children's data to the adult data obtained by Dickman (1963). The adult group mean is 13.2, exactly the mean number of units for ninth graders in the present study. This suggests that the older children in this study are performing perceptual segmentation of the film comparably to the adult subjects in Dickman's research. To examine this possibility more closely and to demonstrate the degree of chance patterning of units of perception in the child samples, an analysis of the pattern of agreement on break

points, i.e., transition points between units of perception, in the behavior sequence was conducted.

Inspection of figures one and two suggest that there are several phase unit locations at which there is considerable agreement among third and ninth graders that one perception unit ends and another begins: phase units 14 and 86 are examples. The question arises, however, whether one can demonstrate statistically the degree to which there is chance or non-chance arrangements of breaks and continuity at each possible phase unit break point.

A binomial expansion was used to set confidence limits on agreement of break on continuity points during the filmed behavior sequence. Dividing the mean number of units used for each age group and the adult sample into the number of possible division points (122) yields the probability of a break or of continuity at each division point or phase unit location. For third grade subjects (mean = 16.6) the probability for a break is $p = .136$ and the probability for continuity is $q = .864$. For ninth grade subjects, $p = .108$ and $q = .892$ given a mean number of units of perception of 13.2. Analysis of the adult data yields a $p = .108$ and $q = .892$ (mean = 13.2).

Through the use of a binomial expansion, confidence limits can be set on the level of non-chance agreement among the subjects on either breaks or continuity at each phase unit card. For third graders, agreement by 12 or more subjects of a break is statistically significant at the .05 level and agreement on continuity of 47 or more of the 50 subjects is significant at .05. For ninth graders, agreement on a break by 10 or more subjects and agreement on continuity by 49 or 50 subjects are statistically significant at the .05 level. For adults, eight or

more subjects must agree on a break and all 38 subjects must agree on continuity to have statistically significant agreement at the .05 level of confidence.

Table 3 summarizes the level of agreement on breaks and continuity for each sample. At slightly less than half of the phase unit locations there is greater than chance agreement on either breaks or

[Insert Table 3 about here]

continuity for all groups. Since the standards for establishing chance and non-chance agreement at each phase unit location varies across the three age groups, no direct statistical test of the similarities or differences in agreement has been made. However, examination of the table indicates a striking similarity in the extent to which there is non-chance patterning of agreement across the three age groups.

One possible explanation for this non-chance patterning might be that such patterning of breaks in the behavior stream may be a reflection of the amount of processing space subjects bring to the task. Assuming comparable limits to processing space among the subjects, then one would expect high agreement on breaking the behavior stream, at least among subjects within age groups for whom there is homogeneity of cognitive abilities. This argument, however, would not necessarily suggest agreement on break points across age groups since different amounts of processing space might be used in this task by children at different age levels.

This possible explanation can be examined by considering: first, the number of break points at which there is significant agreement within an age group; and secondly, the similarity among the significant break points for third and ninth grade children.

As can be seen from Table 3, for slightly more than one out of 10 possible transition points there is significant agreement that a break occurs for all children. This is not startling evidence for the argument that children employ comparable processing space when unitizing the televised behavior stream. Further, for 12 phase unit locations (cards 3, 12, 14, 30, 37, 41, 53, 56, 78, 86, 97 and 101) there is a greater than chance agreement among both third and ninth graders that a break in the behavior stream occurs. This is not necessarily a "high" level of similarity; recall that only 12 third graders and 10 ninth graders needed to agree on a break point to reach the criterion of "significant agreement." Nevertheless, it does provide some evidence of similarity in breaking the behavior stream, and thus, it seems reasonable that third and ninth graders choice of break points is not solely a reflection of comparable amounts of processing space subjects bring to the task.

An alternative explanation, and one that has been considered in the literature on unitizing behavior by Newtson (1973), is that the behavior sequence itself directs the subject's unitizing behavior. Here the argument is that as the subject views ongoing behavior, natural break points appear in the action, break points observers will agree upon. By analogy, book readers should agree upon certain transition points in a novel; for example, a natural transition point is the end of one chapter and the beginning of the next. Are there comparable breaks in the filmed behavior streams?

I would argue that high agreement on break points in the behavior sequence suggests that subjects are "reading" the filmed behavior in a comparable manner.

Dickman (1963), for instance, found several modal break points in his study of adult's unitizing behavior. These modal break points were defined as phase unit locations around which 75% of his subjects agreed that the end of one unit occurs and the start of another unit begins. Seven of the modal break points occur within the 6 minutes of film shown to the children in this study. From Table 4, one can see that

[Insert Table 4 here]

of these seven adult modal break points, four are modal break points for third graders and five are modal break points for ninth graders, since at least 75% of the children agree that a break occurs at these locations. Such high agreement is not typical for the entire behavior sequence. At only one other unit location, phase unit 12, do more than 20% of the children in either age group agree on a break point. At phase unit 12, 38 third graders and 39 ninth graders break the behavior stream.

As Newtson (1973) points out, subjects unitizing behavior in at least a gross manner reflects the action they are observing. One might also ask whether this high agreement on modal break points reflects the behavior sequence the children are watching. Such high agreement that a break occurs in these locations of the film suggest that all three age groups are "reading" the film in a comparable manner. The probability that the third grade children would have model break points at four of the seven modal decision points chosen by adults is .057 (by use of binomial expansion where $p = .75$). For the ninth graders, the probability of agreement on modal break points five of the seven locations chosen by adults is .012.

These data provide some basis for arguing that subjects in all three age groups are reading something about the film which indicates a

natural transition. Consider what occurs at phase unit locations 14, 30, 86 and 97 to examine the nature of these "natural transitions." At each of these phase units there is a shift in scenic location as well as topic of conversation in the program. For example, at phase unit 86 there is a dramatic visual shift, where the film cuts from a scene in the barn to a picture of the family around the dinner table. Such visual and thematic shifts are consistent with Barker and Wright's (1955) suggested cues for distinguishing major units of a behavior stream or episodes which their coders showed high agreement in distinguishing. Further, one might argue that visually, such scene shifts are the units of audio-visual action sequences, the building blocks of TV programs and movies. It seems reasonable then, that the subjects viewing this filmed behavior sequence would tend to isolate and break up these modal groupings. What is of interest here is the high level of agreement among the youngest age level in seeing these changes. The third graders apparently are nearly as sophisticated as the older subjects in segmenting the behavior stream into these modal scenic groupings. This suggests then, that the shorter units the younger children use in segmenting the behavior stream occur <u>within</u> these modal units; the younger children are breaking up the behavior into smaller units within these large modal groupings. Thus, there does appear to be evidence that third and ninth graders are at least equally proficient in visual literacy at "reading" filmed behavior sequences insofar as scenic shifts are viewed as major units of filmed portrayals. However, whether younger children are also sensitive to more subtle filmic techniques, such as camera angle shifts and pacing of film cannot be addressed in this study.

In summary, the data on third and ninth grade children's unitizing behavior supports the hypothesized relationship that younger children use smaller units to segment a televised behavior sequence than do older children. Further, supplementary analyses of patterning of units of perception suggest that such segmentation of the behavior stream occurs in a non-chance manner for both age groups. Some evidence has also been presented suggesting that even the younger children in the study are similar to adults in segmenting modal break points in the film.

Future research on unitizing behavior should explore the relationship between this rather minute aspect of information processing and children's comprehension of the program content. Particularly, Ebbesen, et al (1975) in research with adults, suggests that unitizing activities may be related to viewer's attributions of character traits to the televised characters. Further, perceptual unitizing research could provide additional information on the way in which children vary in how they make sense of audio-visual content.

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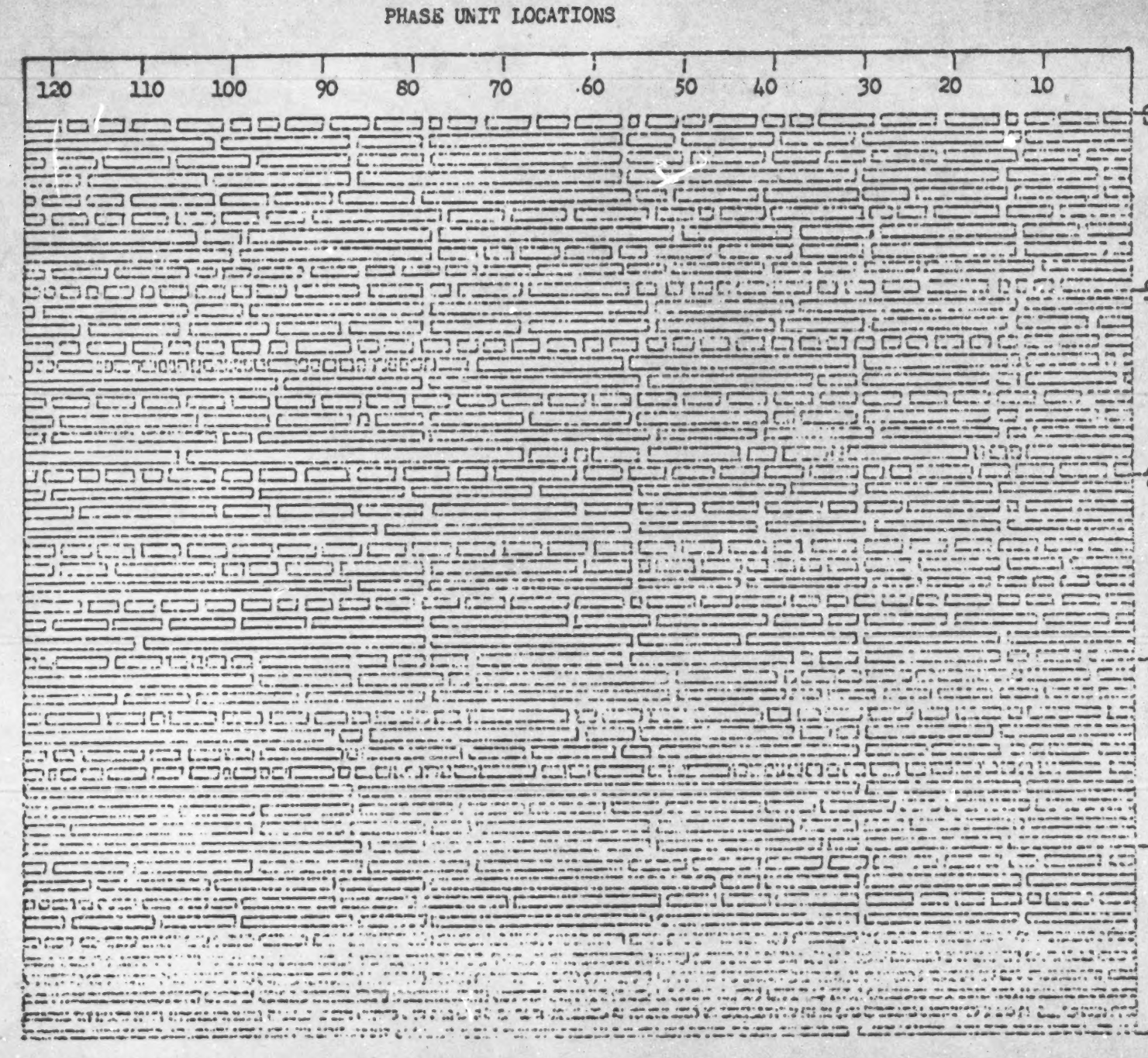

Figure 1. Segmentation of the Behavior Stream for Each Third Grade Subject.

Figure 2. Segmentation of the Behavior Stream for Each Ninth Grade Subject.

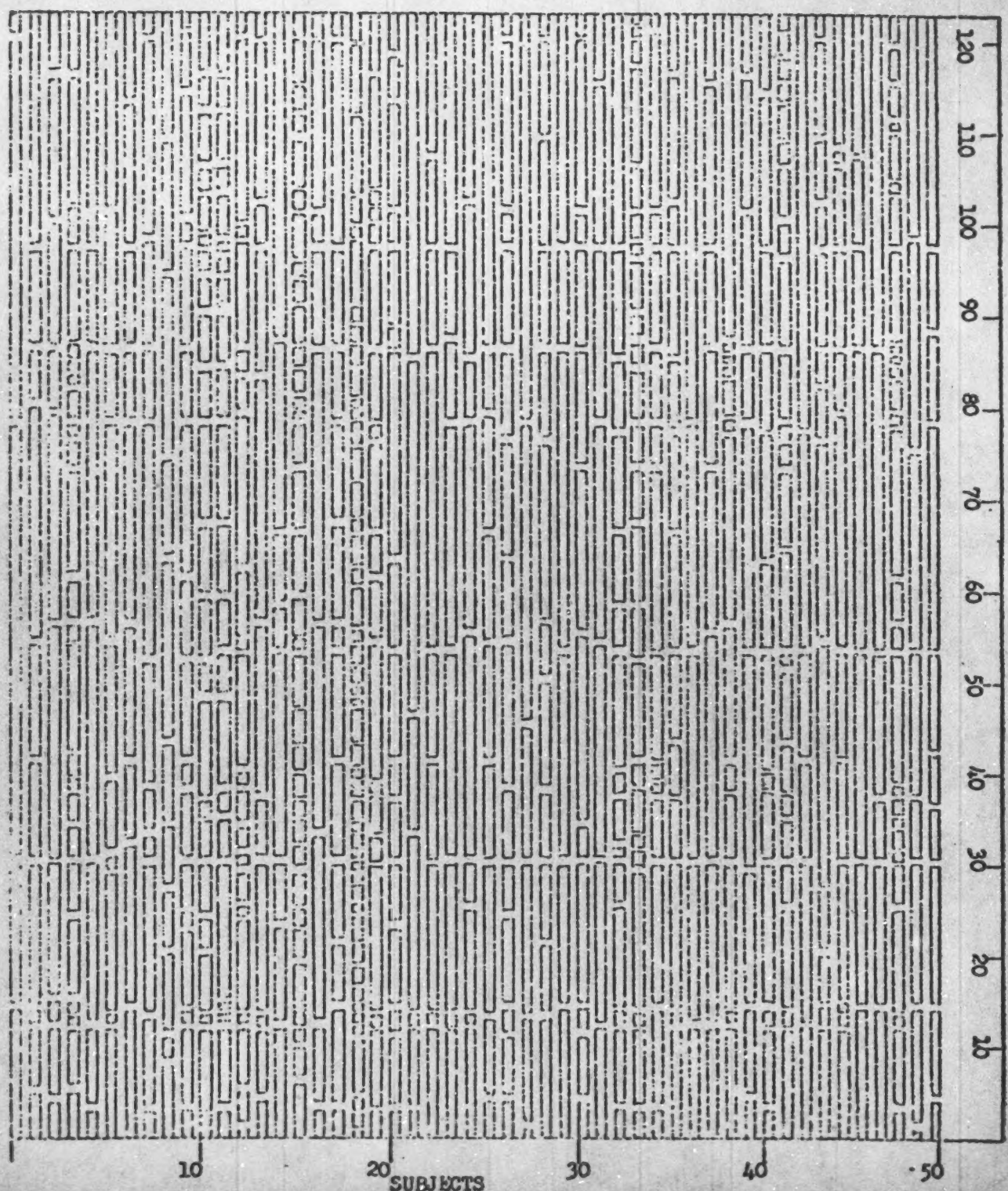

Table 1

Mean Number of Units of Perception Used
to Divide the Filmed Behavior Sequence by Third and Ninth Grade Children

	Third Grade	Ninth Grade
	(N = 50)	(N = 50)
Mean	16.6	13.2
Standard Deviation	9.1	8.3

t (one-tailed) = 1.96 (df = 98) $p<.026$

Table 2

Mean Number of Perception Used
to Segment the Behavior Sequence for Boys and Girls in Third and Ninth Grades

	Third Grade		Ninth Grade	
	Boys (N=25)	Girls (N=25)	Boys (N=25)	Girls (N=25)
Mean	16.5	16.7	12.2	14.2
Standard Deviation	8.3	10.0	8.8	7.7

Table 3

The Percentage of Transitions at Which There is Significant Agreement on Breaks and Continuity and No Agreement for Third Grade, Ninth Grade, and Adult Subjects

	Third Grade	Ninth Grade	Adults
Percentage of Agreement on Break Points	13.9% (17)	11.5% (14)	10.7% (13)
Percentage of Agreement on Points of Continuity	30.4% (37)	36.0% (44)	36.9% (45)
Percentage of No Agreement	55.7% (68)	52.5% (64)	52.4% (64)
N =	122	122	122

Table 4

Agreement on Modal Break Points
for Third Grade, Ninth Grade and Adults

75% of Adults Break at Phase Unit #	Number of Third Grader's Breaking	Number of Ninth Grader's Breaking
14 ± 1	N = 40*	N = 41*
30 ± 1	N = 42*	N = 48*
41 ± 1	N = 25	N = 20
53 ± 1	N = 25	N = 37*
78 ± 1	N = 34	N = 33
86 ± 1	N = 37	N = 40*
97 ± 1	N = 38*	N = 40*

*At these transition points 75% or more of the children agree that a break occurs.